Claims

1. (currently amended) A system to provide internal communication in a stored program controlled system comprising a plurality of processing units, said system comprising:

a single, line-of-sight free space beam line configured to contain optically encoded signals transmitted among said plurality of processing units;

an elongated conduit enclosing the free space beam line;

means in one of said plurality of processing units for injecting optically encoded signals into said beam line; and

means connected to each of said plurality of units for receiving optically encoded signals from said beam line, said receiving means comprising receivers disposed within said conduit in a helical pattern extending outward from an axis of the elongated conduit, said receivers orientated to receive respective portions of the single, line-of-sight free space beam line parallel to the axis.

2. (currently amended) A system to provide internal communication in a stored program controlled system in accordance with claim 1 wherein said ~~plurality of processing units are configured to process signals and each of said processing units configured to perform one or more functions in response to said signals.~~ single, line-of-sight free space beam line is transmitted through said elongated conduit so that the single, line-of-sight free space beam line strikes each of the receivers without having its course of direction being changed.

3. (currently amended) A system to provide internal communication in a stored program controlled system in accordance with claim ~~12~~ further including means for translating optically encoded signals into electrical signals connected between each of said means for receiving optically encoded signals and each of said plurality of processing units.

4. Canceled.

5. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 1 further including a first terminal unit at a first end of said free space beam line configured to transmit said optically encoded signals.

6. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 5 wherein said first terminal unit is further configured to receive optically encoded signals.

7. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 5 further including a second terminal unit configured to receive optically encoded signals.

8. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 7 wherein said second terminal unit is further configured to transmit optically encoded signals in said free space beam line.

9. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 7 wherein said second terminal unit is configured to send signals to said first terminal unit via a means for transmitting signals separate from said free space beam line.

10. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 9 wherein said means for transmitting comprises an optical fiber.

11. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 9 wherein said means for transmitting comprises a second free space beam line.

12. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 9 further including a router connected between said means for transmitting signals and said first terminal configured to route optical signals received at said second terminal to predetermined means for receiving optically encoded signals.

13 -14. Canceled.

15. (previously presented) A system to provide internal communication in a stored program controlled system in accordance with claim 1 wherein said conduit includes an interior surface, wherein said interior surface is reflective.

16. (previously presented) A system to provide internal communication in a stored program controlled system in accordance with claim 1 wherein said conduit includes an interior surface, wherein said interior surface is light absorptive.

17. (previously presented) A system to provide internal communication in a stored program controlled system in accordance with claim 1 wherein said conduit includes a reflective end cap.

18. (previously presented) A system to provide internal communication in a stored program controlled system in accordance with claim 1 wherein said conduit includes a light-absorptive end cap.

19. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 1 further including means for transmitting optically encoded signals into said free space beam line associated with one or more means for receiving optically encoded signals.

20. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 19 wherein said means for receiving and said means for transmitting comprises a bi-directional probe.

21. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 1 wherein each of said plurality of processing units comprises a frame, said frame having a plurality of cards for performing functions and wherein said frame receives optically encoded signals from said means for receiving optically encoded signals,

translates said optically encoded signals into electronically encoded signals, and performs functions related to said plurality of cards.

22. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 21 wherein said frame is further configured to translate electronically encoded signals into optically encoded signals after one or more of said cards performs its respective function, and transmits said optically encoded signals in said free space beam line.

23. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 1 wherein said free space beam line runs above said processing units.

24. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 1 wherein said free space beam line runs below said units.

25. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 1 wherein said means for sending and said means for receiving comprises a probe.

26. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 25 wherein each of said probes includes an optical/electrical interface.

27. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 25 wherein each of said units includes a transmit and receive units.

28. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 1 wherein each of said plurality of units comprises a frame, said frame including a plurality of shelves, each of said shelves including a plurality of processing

cards, and wherein said frame receives optically encoded signals from said free space beam line and distributes said optically encoded signals to each of said shelves within each frame.

29. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 28 further including a probe connected to each shelf for sending and receiving optically encoded signals and translating said signals out of and into electrically encoded signals and distributing said signals among its plurality of processing cards.

30. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 28 wherein each of said shelves distributes said optically encoded signals to each of said processing cards.

31. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 28 where said free space beam line is distributed to said shelves via turning mirrors.

32. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 31 wherein said turning mirrors comprise partially silvered mirrors.

33. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 1 further including a pilot beam in the visible light spectrum.

34. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 1, including a routing function that prevents recirculation of messages that lead to infinite looping.

35. (original) A system to provide internal communication in a stored program controlled system in accordance with claim 1, where the optical characteristics of the said free space beam line prevent infinite feedback loops.

36. (currently amended) A method for transporting signals among units in a stored program controlled system, said method comprising the steps of:

optically encoding said signals;

transmitting said optically encoded signals in a single, line-of-sight free space beam line enclosed within an elongated conduit;

receiving said optically encoded signals with a receiver for each of said processing units;

orienting the receivers within said conduit in a helical pattern extending outward from an axis of the elongated conduit, said receivers orientated to receive respective portions of the single, line-of-sight free space beam line parallel to the axis; and

transmitting further optically encoded signals from each of said processing units.

37. (original) A method in accordance with claim 36 wherein the step of receiving comprises translating said optically encoded signals into electrical signals and said step of transmitting comprises translating electrical signals into optically encoded signals.

38. (original) A method in accordance with claim 36 wherein each unit comprises a frame having a plurality of shelves and wherein the step of receiving comprises routing the optically encoded signals to each shelf in said frame.

39. (original) A method in accordance with claim 36 wherein the step of receiving further comprises translating said optically encoded signals into electrical signals at each of said shelves and said step of transmitting comprises translating electrical signals into optically encoded signals at each of said shelves.

40. (original) A method in accordance with claim 36 wherein each shelf includes a plurality of processing cards and wherein said step of receiving comprises routing the optically encoded signals to each card in said frame.

41. (currently amended) A method in accordance with claim 40 wherein ~~the step of receiving further comprises translating said optically encoded signals into electrical signals at each of said plurality of processing cards said step of transmitting comprises translating electrical~~

~~signals into optically encoded signals at each of said processing cards.~~ single, line-of-sight free space beam line is transmitted through said elongated conduit so that the single, line-of-sight free space beam line strikes each of the receivers without having its course of direction being changed.

42. (currently amended) A system to provide internal communication in a stored program controlled system in accordance with claim 1 wherein the elongated conduit encloses the entirety of the free space beam line and the single, line-of-sight free space beam line strikes each of the receivers without the beam line being reflected or refracted after its originating transmission.

43. (currently amended) A method in accordance with claim 36 further comprising the step of enclosing the entire free space beam line within the elongated conduit and the single, line-of-sight free space beam line strikes each of the receivers without the beam line being reflected or refracted after its originating transmission.